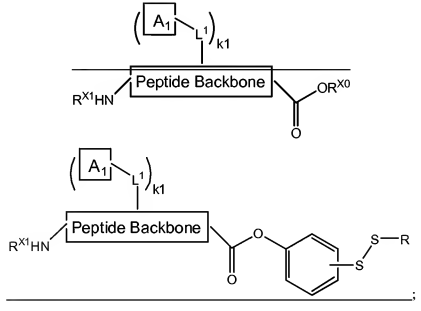
Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application.

1. **(Currently Amended)** A method for preparing a peptide comprising a peptidic backbone made up of four or more amino acids;

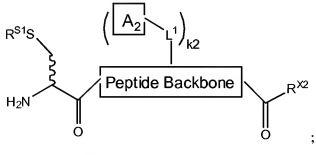
wherein the method comprises a step of:

reacting a peptide acyl donor comprising a peptidic backbone made up of two or more amino acids wherein said peptide acyl donor has the structure:



;

with a peptide amine acceptor having the structure:



;

under reducing reaction conditions employing an excess of a reducing agent;

wherein k1 and k2 are independently integers between 1 and about 20;

each occurrence of A_1 and A_2 is independently an aliphatic, heteroaliphatic, aromatic, heteroaromatic, aryl, or heteroaryl group;

R^{S1} is a sulfide protecting group;

R is aliphatic, heteroaliphatic, aromatic or heteroaromatic;

~~R^{X0} is a disulfide-substituted aryl moiety;~~

each occurrence of L^1 is independently ~~a~~ substituted or unsubstituted, linear or branched, cyclic or acyclic, saturated or unsaturated aliphatic or heteroaliphatic ~~moiety~~;

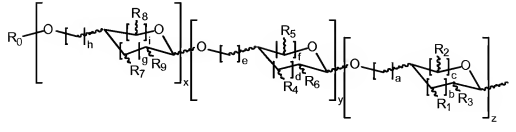
R^{X1} is hydrogen, alkyl, acyl, aromatic, heteroaromatic, aryl, heteroaryl, -alkyl(aryl), -alkyl(heteroaryl), a nitrogen protecting group, an amino acid or a proctected amino acid; and

R^{X2} is $-OR^{X2a}$ or $-NR^{X2b}R^{X2c}$, wherein R^{X2a} is hydrogen, alkyl, aromatic, heteroaromatic, aryl, heteroaryl, -alkyl(aryl), -alkyl(heteroaryl), a carboxylic acid protecting group, an amino acid or a proctected amino acid; and R^{X2b} and R^{X2c} are independently hydrogen, alkyl, aromatic, heteroaromatic, aryl, heteroaryl, -alkyl(aryl), -alkyl(heteroaryl), a nitrogen protecting group, an amino acid or a proctected amino acid.

2. **(Canceled)**

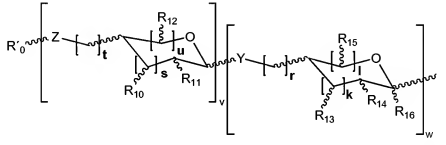
3. **(Currently Amended)** The method of claim 1, wherein each occurrence of ~~A1~~ A_1 and ~~A2~~ A_2 is independently a ~~biomolecule~~ carbohydrate determinant, a small molecule, ~~a macromolecule~~ or a diagnostic label.

4. **(Currently amended)** The method of claim 1, wherein each occurrence of ~~A1~~ A_1 and ~~A2~~ A_2 is independently a carbohydrate determinant having the structure:



wherein a, b, c, d, e, f, g, h, i, x, y and z are independently 0, 1, 2 or 3, with the proviso that the x, y and z bracketed structures represent furanose or pyranose ~~moieties~~ groups and the

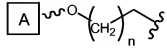
sum of b and c is 1 or 2, the sum of d and f is 1 or 2, and the sum of g and i is 1 or 2, and with the proviso that x, y and z are not simultaneously 0; wherein R_0 is hydrogen, a linear or branched chain alkyl, acyl, arylalkyl or aryl group; wherein each occurrence of R_1, R_2, R_3, R_4, R_5, R_6 , R_7, R_8 and R_9 is independently hydrogen, OH, OR^i, NHR^i, $NHCOR^i$, F, CH_2OH, CH_2OR^i, a substituted or unsubstituted linear or branched chain alkyl, (mono-, di- or tri)hydroxyalkyl, (mono-, di- or tri)acyloxyalkyl, arylalkyl or aryl group; wherein each occurrence of R^i is independently hydrogen, CHO, $COOR^{ii}$, or a substituted or unsubstituted linear or branched chain alkyl, acyl, arylalkyl or aryl group or a saccharide ~~moiety~~ having the structure:



wherein Y and Z are independently NH or O; wherein k, l, r, s, t, u, v and w are each independently 0, 1 or 2; with the proviso that the v and w bracketed structures represent furanose or pyranose ~~moieties~~ groups and the sum of l and k is 1 or 2, and the sum of s and u is 1 or 2, and with the proviso that v and w are not simultaneously 0; wherein R'_0 is hydrogen, a linear or branched chain alkyl, acyl, arylalkyl or aryl group; wherein each occurrence of R_{10}, R_{11}, R_{12}, R_{13}, R_{14} and R_{15} is independently hydrogen, OH, OR^{iii}, NHR^{iii}, $NHCOR^{iii}$, F, CH_2OH, CH_2OR^{iii}, or a substituted or unsubstituted linear or branched chain alkyl, (mono-, di- or tri)hydroxyalkyl, (mono-, di- or tri)acyloxyalkyl, arylalkyl or aryl group; wherein each occurrence of R_{16} is hydrogen, COOH, $COOR^{ii}$, $CONHR^{ii}$, a substituted or unsubstituted linear or branched chain alkyl or aryl group; wherein each occurrence of R^{iii} is hydrogen, CHO, $COOR^{iv}$, or a substituted or unsubstituted linear or branched chain alkyl, acyl, arylalkyl or aryl group; and wherein each occurrence of R^{ii} and R^{iv} are each independently H, or a substituted or unsubstituted linear or branched chain alkyl, arylalkyl or aryl group.

5. **(Withdrawn/Currently Amended)** The method of claim 1, wherein each occurrence of L^1 is independently $-O-(CH_2)_n-$, wherein n is 0-9, or a glycoside-containing ~~moiety~~ group.

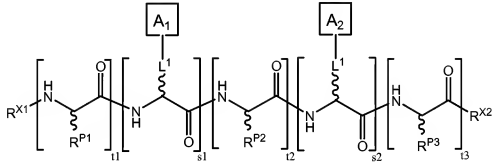
6. **(Withdrawn/Currently Amended)** The method of claim 1, wherein L^1 is $-O-(CH_2)_n-CH_2-$ and two or more non-adjacent amino acids is/are independently substituted with a ~~moiety~~ group having the structure:



wherein each occurrence of n is independently 0-8.

7. **(Currently Amended)** The method of claim 1, wherein each occurrence of ~~A1~~ A_1 and ~~A2~~ A_2 is independently selected from the group consisting of Globo-H, fucosyl GM1, KH-1, glycophorin, STn, (2,3)ST, Le^y, Le^x, N3, Tn, 2,6-ST, Gb3 and TF.

8. **(Currently Amended)** The method of claim 1, wherein the peptide has the structure:



wherein s1 and s2 are independently an integer from 1 to about 20;

t1, t2 and t3 are each independently an integer;

R^{X1} is hydrogen, alkyl, acyl, aromatic, heteroaromatic, aryl, heteroaryl, -alkyl(aryl), -alkyl(heteroaryl), a nitrogen protecting group, an amino acid or a proctected amino acid;

R^{X2} is $-OR^{X2a}$ or $-NR^{X2b}R^{X2c}$, wherein R^{X2a} is hydrogen, alkyl, aromatic, heteroaromatic, aryl, heteroaryl, -alkyl(aryl), -alkyl(heteroaryl), a carboxylic acid protecting group, an amino acid or a proctected amino acid; and R^{X2b} and R^{X2c} are independently hydrogen, alkyl, aromatic, heteroaromatic, aryl, heteroaryl, -alkyl(aryl), -alkyl(heteroaryl), a nitrogen protecting group, an amino acid or a proctected amino acid;

R^{P1}, R^{P2} and R^{P3} are independently H, alkyl, heteroalkyl, aromatic, heteroaromatic, aryl, heteroaryl, -alkyl(aryl), -alkyl(heteroaryl), or a natural or non-natural amino acid side chain;

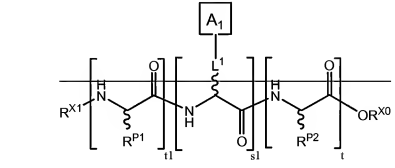
each occurrence of L^1 is independently ~~a~~ substituted or unsubstituted aliphatic or heteroaliphatic ~~moiety~~;

A_1 and A_2 are each independently an aliphatic, heteroaliphatic, aromatic, heteroaromatic, aryl, or heteroaryl group; and

at least one occurrence of the bracketed structure t2 is a cysteine residue or protected cysteine residue;

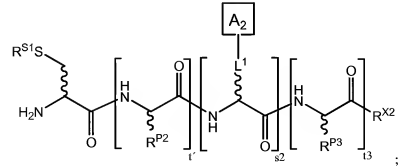
and the method comprises a step of:

reacting a peptide acyl donor having the structure:



;

with a peptide amine acceptor having the structure:

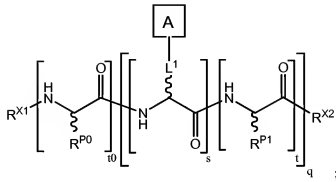


;

under reducing reaction conditions employing an excess of a reducing agent;

wherein the sum t+t′ equals (t2)+1.

9. **(Previously Presented)** The method of claim 8, wherein the step of reacting the peptide acyl donor with the peptide amine acceptor is repeated a desired number of times, to prepare a peptide having the structure:



;

wherein R^{X1} and R^{X2} are as defined in claim 8;

each occurrence of A may be the same or different and may be as defined for A_1 and A_2 in claim 8;

each occurrence of R^{P1} may be the same or different and may be as defined for R^{P1} and R^{P2} in claim 8;

q is an integer greater than or equal to 2;

each occurrence of s is independently an integer from 1 to about 20;

each occurrence of t is independently an integer;

t0 is an integer; and

each occurrence of R^{P0} is independently H, alkyl, heteroalkyl, aromatic, heteroaromatic, aryl, heteroaryl, -alkyl(aryl), -alkyl(heteroaryl), or a natural or non-natural amino acid side chain.

10. **(Original)** The method of claim 9, wherein q is an integer between 2 and about 5.

11. **(Original)** The method of claim 9, wherein q is 2.

12. **(Original)** The method of claim 9, wherein the sum s+t is between about 2 and about 6.

13. **(Original)** The method of claim 9, wherein t0 is an integer from 0 to about 20.

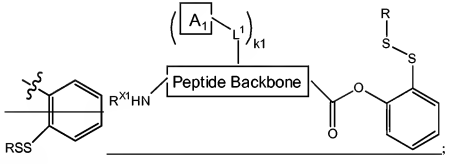
14. **(Original)** The method of claim 9, wherein R^{X1} is hydrogen, Fmoc or Ac.

15. **(Original)** The method of claim 9, wherein R^{X2} is NH_2.

16. **(Cancelled)**

17. **(Cancelled)**

18. **(Currently Amended)** The method of claim ~~17~~ 1, wherein R^{X0} the peptide acyl donor has the structure:



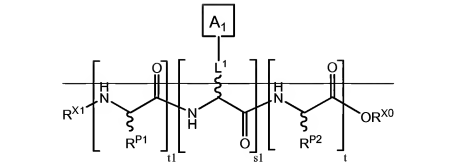
;

wherein R is lower alkyl.

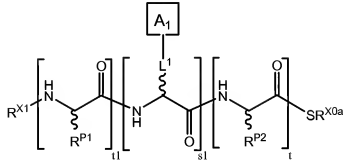
19. **(Original)** The method of claim 18, wherein R is ethyl.

20. **(Original)** The method of claim 9, wherein R^{S1} is -S*t*Bu.

21. **(Currently Amended)** The method of claim 9, wherein in the step of reacting the peptide acyl donor having the structure:



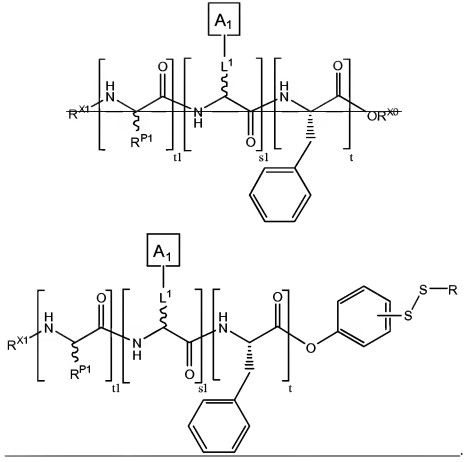
with the peptide amine acceptor, an intermediate having the following structure is formed in situ:



wherein R^{X0a} is ~~an~~ oxygen-substituted aryl ~~moiety~~.

22. **(Previously Presented)** The method of claim 21, wherein the reducing agent is 2-mercaptoethanesulfonic acid, sodium salt.

23. **(Currently Amended)** The method of claim 9, wherein the peptide acyl donor has the structure:



24. **(Withdrawn)** The method of claim 1, wherein at least one occurrence of A_1 or A_2 is a carbohydrate domain, and some or all of carbohydrate domains are O-linked to the peptide backbone.

25. **(Previously Presented)** The method of claim 1, wherein at least one occurrence of A_1 or A_2 is a carbohydrate domain, and some or all of carbohydrate domains are N-linked to the peptide backbone.

26. **(Withdrawn)** The method of claim 1, wherein the peptide is symmetrical.

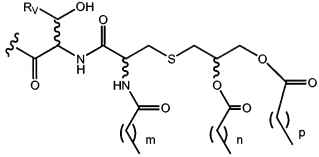
27. **(Previously Presented)** The method of claim 1, wherein the peptide is nonsymmetrical.

28. **(Withdrawn)** The method of claim 1, further comprising a step of conjugating the peptide to an immunogenic carrier.

29. **(Withdrawn)** The method of claim 28, wherein the carrier is a protein, a peptide or a lipid.

30. **(Withdrawn)** The method of claim 28, wherein the carrier is Bovine Serum Albumin (BSA), Keyhole Limpet Hemocyanin (KLH) or polylysine.

31. **(Withdrawn)** The method of claim 28, wherein the carrier is a lipid carrier having the structure:

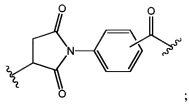


wherein m, n and p are each independently integers between about 8 and 20; and R_V is hydrogen, substituted or unsubstituted linear or branched chain lower alkyl or substituted or unsubstituted phenyl.

32. **(Withdrawn)** The method of claim 31, wherein m′, n′ and p′ are each 14.

33. **(Withdrawn)** The method of claim 28, wherein the carrier is linked to the peptide through a crosslinker.

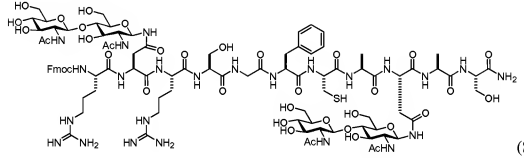
34. **(Withdrawn)** The method of claim 33, wherein the crosslinker is a fragment having the structure:



;

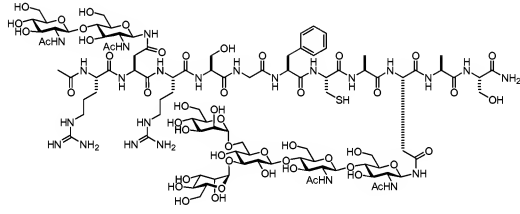
whereby said structure is generated upon conjugation of a maleimidobenzoic acid N-hydroxy succinimide ester with a suitable functionality on the peptide.

35. **(Previously Presented)** The method of claim 1, wherein the peptide has the structure:



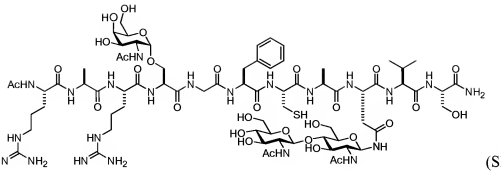
(SEQ ID NO: 6).

36. **(Withdrawn)** The method of claim 1, wherein the peptide has the structure:



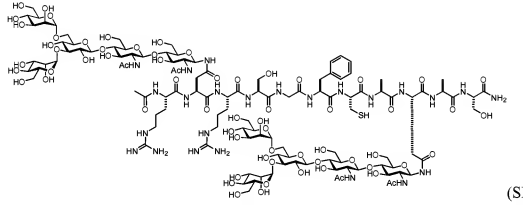
(SEQ ID NO: 6).

37. **(Withdrawn)** The method of claim 1, wherein the peptide has the structure:



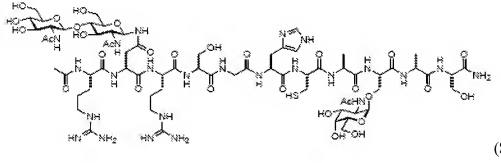
(SEQ ID NO: 7).

38. **(Withdrawn)** The method of claim 1, wherein the peptide has the structure:



(SEQ ID NO: 6).

39. **(Withdrawn)** The method of claim 1, wherein the peptide has the structure:



(SEQ ID NO: 8).

40. **(Cancelled)**